Aviation Investigation Final Report

Location:	Sedona, Arizona	**Accident Number:**	LAX07LA130
Date & Time:	April 15, 2007, 12:10 Local	**Registration:**	N9556Y
Aircraft:	Beech 35-B33	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The single engine airplane impacted the slope of a bluff 200 feet short of, and below, the runway and was destroyed during the ensuing post impact fire. The airport is located on a plateau, with terrain that drops off steeply at both ends of the single runway. Wind gusts at the runway surface were recorded at 38 knots. According to FAA publication AC 00-57 - "Hazardous Mountain Winds and Their Visual Indicators," strong winds that are at the crest of a ridge or level with a mountain peak can create moderate or greater turbulence, strong up and down drafts, and very strong rotor and shear zones. Wind shear is defined as "A sudden, drastic shift in wind speed, direction, or both that may occur in the horizontal or vertical plane." A pilot, who had landed at the airport just before the accident airplane, reported severe turbulence and a 30-knot windshear at the approach end of the runway, and transmitted that information to the accident pilot. According to witnesses, the accident airplane appeared to get low and slow while on final, likely encountered an abrupt wind shear zone, and descended below the elevation of the approach end of the runway. To maintain the airplane flying, and to avoid the terrain, the pilot would have had to raise the nose, which increased the wings angle of attack, and therefore, decreased the stall margin. As it dropped below the level of the runway, a witness reported that the airplane assumed a nose high attitude, and the engine sounded as if it were operating at high rpm and "straining against the wind." The wing tips wobbled up and down, indicative of a stall, before the airplane rolled to the right and impacted rising terrain short of the runway. According to another pilot who routinely flew with the accident pilot, the accident pilot routinely flew approaches that were shallower than the 3.5-degree glide slope approach path that is recommended at this airport, which is equipped with a precision approach path indicator (PAPI) lighting system set to 3.5 degrees. In this instance, the pilot let the airplane drop well below the recommended glide slope during the approach to this runway. Medications that were identified in the pilot's toxicological report had been prescribed to treat his ongoing medical conditions and relieve pain.

While the medications can cause impairment or spatial disorientation, the clear weather on

this day, the low levels of medication found in the pilot's system (suggesting no recent use), and the circumstances of the accident make it unlikely that the medications had an effect on the pilot's ability to control the aircraft.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate compensation for the high wind conditions and wind shear encounter on final approach, that led to a failure to maintain an adequate airspeed and a stall.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. (F) WEATHER CONDITION - HIGH WIND
2. (F) WEATHER CONDITION - WINDSHEAR
3. (C) COMPENSATION FOR WIND CONDITIONS - INADEQUATE - PILOT IN COMMAND
4. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
5. (C) STALL - ENCOUNTERED - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
6. TERRAIN CONDITION - RISING
7. OBJECT - TREE(S)

Factual Information

THIS CASE WAS MODIFIED 11/21/2007

HISTORY OF FLIGHT

On April 15, 2007, at 1210 mountain standard time, a Beech 35-B33, N9556Y, impacted terrain while on a low approach for landing at Sedona Airport, Sedona, Arizona. The pilot and two passengers were fatally injured; the airplane was destroyed. The pilot-owner operated the airplane under the provisions of 14 CFR Part 91. Visual meteorological conditions prevailed, and no flight plan had been filed. The flight originated at La Cholla Airpark, Tucson, Arizona, at 1112.

The Sedona Airport is located on a plateau, and the terrain drops off steeply at both ends of the single runway. There were high winds in the vicinity with recorded gusts up to 38 knots, and one witness reported 47-knot gusts. Witnesses reported to the National Transportation Safety Board investigator that they observed the airplane on its final approach to runway 21. All witnesses stated that the airplane appeared to get "low and slow" while on final, descending below the approach end of the runway. The airplane had a nose high attitude, and the engine sounded as if it was operating at high rpm "straining against the wind." They said the wing tips appeared to wobble up and down starting with the right wing; the airplane rolled to the right, and impacted rising terrain short of the runway. A post impact fire erupted immediately and consumed the airplane.

The pilot of a twin Piper PA-34 made his approach and landing directly ahead of the accident pilot, and reported that the winds were 140 to 160 degrees at 23 knots gusting to 36 knots during his approach. On short final he encountered a 30-knot windshear and an abrupt negative 2.5-G drop. He radioed to the accident pilot that he had encountered a 30-plus knot windshear on final; the accident pilot responded "in a calm voice," "ok, thank you for the heads up."

PERSONNEL INFORMATION

A review of the Federal Aviation Administration (FAA) airman records revealed that the pilot held a commercial pilot certificate issued on June 26, 1968, with ratings for single engine land and instrument airplane. Investigators were unable to locate the pilot's personal flight logbook. The pilot reported on his most recent FAA medical application form, dated July 5, 2006, that he had an estimated total flight time of 2,180 hours.

The pilot held a third-class medical certificate that was issued on July 5, 2006, with the limitation that he shall wear corrective lenses.

AIRCRAFT INFORMATION

The airplane was a 1963 Beech 35-B33, serial number CD-561, commonly referred to as a "Debonair." The engine was a Teledyne-Continental IO-470-K3B. Investigators were unable to locate the airplane's maintenance logbooks. The airframe and power plant (A&P) mechanic who performed the last annual inspection for the airplane provided copies of those documents to the Safety Board investigator. The most recent airframe, engine, and propeller annual inspection had been completed on June 3, 2006. The maintenance documentation indicated that the total airframe time was 3,938.72 hours, and the time on the engine was 1,316.49 hours since major overhaul (SMOH). The airplane was configured with a short takeoff and landing (STOL) kit. The mechanic noted that the pilot had planned on having the airplane's annual inspection performed in May.

METEOROLOGICAL INFORMATION

The pilot contacted Albuquerque Flight Service on April 15, at 1009 local time, and requested a weather brief for Sedona, as well as winds aloft for 6,000 and 9,000 feet. The briefer stated that there were AIRMETS out for occasional moderate turbulence 18,000 and below, to which the pilot replied, "Yeah, it's going to be bumpy." The briefer then stated winds aloft for 6,000 feet in the Sedona area were 170 degrees at 25 knots, and at 9,000 feet, the winds were 210 degrees at 40 knots.

A review of weather data showed a surface cold front was passing through the Sedona area near the accident time. The front and strong low-level southerly winds caused variable gusty surface winds, low-level wind shear, and moderate turbulence over Arizona throughout the day. The Aviation Area Forecast, AIRMET TANGO for moderate turbulence, and the Flagstaff Terminal Forecast valid at the accident airplane's departure time indicated the general en route and destination flight conditions.

At 1221, the Sedona Airport Automated Weather Observation System recorded scattered clouds at 9,000 feet; visibility 10 statute miles; winds from 270 degrees at 38 knots; temperature 18 degrees Celsius; and altimeter setting 29.75 inches of mercury.

AERODROME INFORMATION

The Sedona Airport is located on a 500-foot-high mesa that overlooks the town of Sedona. The terrain descends steeply from the airport on all sides to the valleys below. The Southwest U.S. Airport/Facility Directory, published by the U.S. Department of Transportation, stated, in the Airport Remarks section, that turbulence might be experienced in the vicinity of the airport.

The Precision Approach Path Indicator (PAPI) lights on the approach end of runway 21 are set for a 3.5-degree approach glide slope.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located on sloping terrain about 200 feet north of the approach end of runway 21. The airplane was completely consumed by a post impact fire. FAA inspectors examined the wreckage on scene. There was a 5-inch diameter tree that was fractured, missing its top, and a piece of fiberglass wing tip was at its base. This corresponded to an indentation to the right wing tip; the indentation was formed from the bottom up, consistent with a nose high attitude. The airplane appeared to have rotated 90 degrees to the right after the wing tip impact, and impacted the terrain in that orientation. The main wreckage was on the extended centerline of the runway. The FAA inspectors traced out the flight control system and confirmed control continuity. The entire airplane was confined to the accident location, and the wreckage was distributed such that the wings, fuselage, engine, and tail were in their normal and appropriate location/position. The propeller had sheared from the engine crankshaft, and one propeller blade was located at the approach end of the runway. The other two propeller blades were contained within the main wreckage.

MEDICAL AND PATHOLOGICAL INFORMATION

The Yavapai County Medical Examiner completed the autopsy on the pilot. The FAA Forensic Toxicology Research Team performed toxicological analysis from blood and tissue specimens obtained during the autopsy. The results of the specimen analysis were negative for carbon monoxide, cyanide, and ethanol. The results were positive for Butalbital (0.101 ug/ml in blood and 0.213 ug/ml in the liver), Propoxyphene (0.046 ug/ml in blood and 0.472 ug/ml in the liver), Norpropoxyphene (0.394 ug/ml in blood and 12.265 ug/ml in the liver), and Quinine (in blood).

The Safety Board's Medical Officer reviewed the blue ribbon copy of the pilot's FAA medical records, medical records obtained from the pilots personal physician, and the autopsy report. The pilot had reported a long history of inflammatory bowel disease, bilateral hip replacements, and subsequent revisions for arthritis beginning more than 35 years prior to the accident. The FAA medical records documented the use of medications including folic acid and vitamin B12 shots, acetaminophen for arthritis pain, and lisinopril for high blood pressure, which was well controlled. Personal medical records noted rare use of propoxyphene and a combination medication containing butalbital, caffeine, and acetaminophen, neither of which were noted in the most recent application for Airman Medical Certificate.

ADDITIONAL INFORMATION

Statement from the Mechanic

The A&P mechanic who regularly performed the annual inspection also holds an airline transport pilot (ATP) certificate; his primary employment was that of an airline pilot. He would routinely fly with the accident pilot during the post-inspection maintenance check flight. He noted that the accident pilot routinely flew a low and flat landing approach pattern, which he

estimated to be around a 2.5-degree glide slope. The mechanic/ATP reported that his preference was for a steeper approach, around 3- to 3.5-degree glide slope. When he asked the accident pilot why he flew a flatter approach technique, the pilot said that he thought the shallower approaches were safer because of the enhanced capability the plane had with the STOL kit installation, which provided for a lower stall speed.

Windshear and Mountain Winds Discussion

The following was extracted from FAA publication AC 00-57 - "Hazardous Mountain Winds and Their Visual Indicators."

"Aircraft that engage in low-level flight operations over mountainous terrain in the presence of strong winds (20 kt or greater at ridge level) can expect to encounter moderate or greater turbulence, strong up and down drafts, and very strong rotor and shear zones. This is particularly true for general aviation aircraft."

"The mountain flying literature cites 20 kt as the criterion for classifying a wind as 'strong.' As used in the current document, this criterion refers to the large-scale (or prevailing wind in the area as opposed to a local wind gust) wind speed at the crest of the ridge or level of the mountain peaks, upwind of the aircraft's position. Such an ambient wind flow perpendicular to a ridge will lead to substantially stronger surface winds, with the likelihood of turbulence. Similar wind enhancements can be anticipated near the slopes of an isolated peak. Forecast and actual wind speeds at ridge level can be determined from the FD (forecast winds and temperatures aloft) and UA (PIREPS) products, respectively. In contrast, downdrafts over forested areas may be strong enough to force aircraft down into the trees, even when the aircraft is flown at the best rate-of-climb speed. This effect on the aircraft is exacerbated by loss of aircraft performance because of the high-density altitude."

Glidepath Control

The following was extracted from FAA publication FAA-H-8083, The Airplane Flying Handbook.

"WIND SHEAR - A sudden, drastic shift in wind speed, direction, or both that may occur in the horizontal or vertical plane."

"On final approach, at a constant airspeed, the glidepath angle and rate of descent is controlled with pitch attitude and elevator. The optimum glidepath angle is 2.5 degrees to 3 degrees whether or not an electronic glidepath reference is being used. On visual approaches, pilots may have a tendency to make flat approaches."

Pilot Information

Certificate:	Commercial	**Age:**	67,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3	**Last FAA Medical Exam:**	July 1, 2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	2180 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N9556Y
Model/Series:	35-B33	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	CD-561
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 1, 2006 Annual	**Certified Max Gross Wt.:**	2650 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3938.72 Hrs as of last inspection	**Engine Manufacturer:**	Teledyne Continental
ELT:		**Engine Model/Series:**	IO-470
Registered Owner:	James B. Franklin	**Rated Power:**	225 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSEZ,4827 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	12:21 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Scattered / 9000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	38 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.75 inches Hg	**Temperature/Dew Point:**	18°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tucson, AZ (K57A)	**Type of Flight Plan Filed:**	None
Destination:	Sedona, AZ (KSEZ)	**Type of Clearance:**	VFR
Departure Time:	11:12 Local	**Type of Airspace:**	

Airport Information

Airport:	Sedona KSEX	**Runway Surface Type:**	Asphalt
Airport Elevation:	4830 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	21	**IFR Approach:**	None
Runway Length/Width:	5129 ft / 100 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	34.848609,-111.788612

Administrative Information

Investigator In Charge (IIC):	McKenny, Van
Additional Participating Persons:	Gary Hamlin; Federal Aviation Administration; Scottsdale, AZ Jason Lukasic; Teledyne-Continental Motors; Mobile, AL
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Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65591